if we insist on having the article and refuse to pay the cost. But this remedy is applicable only to some small part of our total product. When we come to such industries as those now talked of it is impossible. We must make the industry self-contained.

But it may be said that those most concerned are not striving alone, or even chiefly, for higher wages, but desire to participate in the management and to bear their part in deciding the questions of policy which up to now have been in the hands of the employers. To this no fundamental objection can be raised. The more completely the men engaged in any enterprise understand it, the better it will probably be for the whole. But large questions of policy require knowledge and appreciation of circumstances which can with difficulty be acquired by persons whose life is necessarily passed in quite other surroundings. That the fullest information should be given to the persons in question cannot be denied. The claim to deal with matters of management lying quite beyond their competence cannot be conceded. The final impulse comes from one mind which cannot divest itself of its responsibility or exercise it under such conditions as those suggested would impose.

A universal unrest pervades the world. This had indeed already become apparent before 1914. The war has exacerbated the symptoms which were already sufficiently menacing. Remedies by legislation had been applied here and elsewhere without success. In the nineteenth century the political emanicipation of the inhabitants of this country was gradually effected. By the end of it freedom had been practically won. The great changes which occurred in the political condition of the country as it was before 1832 and as it became by the end of the century had been brought about with relatively little trouble. It is not surprising that this should have led to the conclusion that economic changes could be effected with equal ease. Perhaps the confusion which we continually observe between a "law" imposed by the will of a legislature and a "law of Nature," so called, is responsible for this conclusion.

Having gained political freedom comparatively easily, people seem to have thought economic freedom could be got with equal facility. We have had numerous instances of this on which it is unnecessary to dwell. Concessions have been made by which, apparently, life was made much easier for certain people. But the fund out of which these concessions were to come has not been increased. Many of them, though not so intended, had the effect of positively lessening that total. In a perfect world it ought not to have had this effect, but, human nature being what it is, it was easy to foresee the result. It could have been foretold that a minimum wage established by law would sooner or later reduce the output of the man paid by piece. It had that effect on the coal-miners at a very early date after its enactment.

The demand for higher wages without a corresponding increased output was causing anxiety before the outbreak of war. The inordinate expenditure which the war brought with it seemed to justify the contention of the workmen that the claims they had put forward could easily have been met in the past, and must be conceded when things became normal again. It was forgotten that all thought of economic production had ceased. We were living, not on the earnings of the year, but on credit raised on our expectations of the future. In the past this course was also pursued, but (as has already been pointed out) in very different circumstances, for the capital thus created was calculated to yield an adequate return to the persons interested.

None of the remedies proposed touches the difficulty. We must obtain a larger product if we are to have more to divide. Restrictions in output, whether produced by the act of the Legislature, the will of the worker, or (let us add) the hindrance of a tariff, will fail to effect this. None of the short cuts now proposed will lead us to our goal. Can we convince those most deeply interested of the truth of this? The task is not an easy one, for promises without end are made to accomplish what is desired without pursuing the patient and laborious course which alone can lead to a happy solution. For my part, I rely on the common sense of my fellow-countrymen. The speedy abolition of all artificial prices by which we shall get to know the real cost of what we buy will be a great help. We may hope that on this will follow an earnest desire on the part of all to do their best for the commonweal—convinced that on this intelligent altruism we are best serving our own ends. A better division of industry would ensue. The net result would be a happy and contented nation, in which the efforts of each would be more guided by the common welfare than by the selfish desire for the advantage of the individual.

None of these things can be accomplished by Acts of Parliament. Statutory prices and statutory hours offer no solution—rather increase the evil than lessen it. There is no royal road by which we can travel to a solution. We must, by patience and mutual forbearance, seek to alter the present hostile attitude. We may frankly accept Prof. Cannan's opinion that "the economic organisation of the nineteenth and early twentieth centuries will not endure for ever, but will be gradually replaced by something else more suitable for its own day and generation."[1]

Let all parties in the State bend themselves to this change, in which, again to quote Prof. Cannan, "free associations of free men able to go out and come in as each pleased would voluntarily give service for service, irrespective of domicile and nationality." This is a change which we may agree with him in thinking more "desirable than any restoration of the feudal system basing economic organisation on the territory of the lord, even if the personal lord of the Middle Ages is replaced by a Parliament elected by universal suffrage and proportional representation."[2]

FORTHCOMING BOOKS OF SCIENCE.

SINCE the appearance of the article on "Forthcoming Books of Science" in NATURE of October 16, some further lists of books likely to appear in the near future have reached us. *The Cambridge University Press* is to publish "The Transmutation of Bacteria," Dr. S. Gurney-Dixon, and "Notes on Magnetism," C. G. Lamb. *Messrs. C. Griffin and Co., Ltd.,* announce "The Flow and Measurement of Air and Gas," A. B. Eason; "The Practical Design of Plate Girder Bridges," H. Bird, illustrated; "Marine Diesel Engines: Maintenance and Running," J. Lamb, illustrated; "Laboratory Aids in Practical Mechanics," G. S. Bowling; "Airman's International Dictionary, English–French–Italian–German," Lieut. M. M. Dander; "A Treatise on Surveying and Levelling," S. Threlfall, illustrated; "Modern Mine Valuation," D. Penman, illustrated; "Peat Reference Book," F. T. Gissing; "Coke-Oven and By-Products Works Chemistry," T. B. Smith, illustrated; "Coal Economy: The Reduction of National Coal Consumption by 50 Million Tons a Year," W. H. Casmey; "Analytical Chemistry as a Profession for Women," Emily A. L. Forster; "Text-book of Inorganic Chemistry,"

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[1] "Coal Nationalisation," p. 25.

[2] *Ibid.*

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vol. ix., Cobalt, Nickel, and the Elements of the Platinum Group, Dr. J. Newton Friend, and Iron, Dr. J. Newton Friend and J. Bentley; and new editions of "A Treatise on Petroleum," Sir Boverton Redwood, Bart., in 4 vols.; "Electrical Practice in Collieries," Prof. D. Burns; "The Problem of Flight: A Text-book of Aerial Engineering," H. Chatley; "The Mineralogy of the Rarer Metals," E. Cahen and W. O. Wootton; "Elementary Agricultural Chemistry," H. Ingle; "Dairy Chemistry," H. D. Richmond; "Paper Technology," R. W. Sindall; "Modern Road Construction," F. Wood; "The Physico-Chemical Properties of Steel," Dr. C. A. Edwards; "General Foundry Practice," A. McWilliam and P. Longmuir; "A Medical Handbook," Dr. R. S. Aitchison; "Introduction to the Study of Midwifery," by Dr. A. Donald, illustrated; "A Manual of Elementary Seamanship," D. Wilson-Barker; and "Elementary Coal-Mining," G. L. Kerr. The new list of the *J. B. Lippincott Co.* includes "The Harvey Lectures, Delivered under the Auspices of the Harvey Society of New York, 1917–1919"; "Training of a Pharmacist," D. C. O'Connor, illustrated; "Airplane Photography," Major H. E. Ives, illustrated; "Training for the Electric Railway Business," C. B. Fairchild, illustrated; and "Applied Economic Botany," Prof. M. T. Cook, illustrated. They have also a number of volumes in preparation for appearance in the series of "Monographs on Experimental Biology and General Physiology." *Mr. John Murray* promises "Science and Life: Aberdeen Addresses," Prof. F. Soddy; "Springtime and Other Essays," Sir Francis Darwin; "The Life of Sir William White, K.C.B., F.R.S.," F. Manning, illustrated; "The Shibboleths of Tuberculosis," Dr. M. Paterson; "Theodore Roosevelt's Letters to his Children," edited by J. B. Bishop; "Wild Life in Canada," Capt. A. Buchanan, illustrated; "Homing with the Birds," Gene Stratton-Porter; "Strategic Camouflage: The Probing of a German Secret," S. A. Solomon, illustrated; and a new and enlarged edition of "Microscopy: The Construction, Theory, and Use of the Microscope," E. J. Spitta, illustrated. We notice that Dr. E. A. Wallis Budge's long-expected new book is to be entitled "By Nile and Tigris: A Narrative of Journeys in Egypt and Mesopotamia on Behalf of the British Museum between the Years 1886–1913." It will be in two volumes and illustrated.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

BRISTOL.—A new chair of physical chemistry has been established in the University on the endowment of Lord Leverhulme. Capt. J. W. McBain, lecturer in physical chemistry in the University since its foundation, has been appointed to the chair.

OXFORD.—We understand that Prof. S. H. Vines is retiring from the Sherardian professorship of botany in the University at the end of the current year.

SHEFFIELD.—On Friday, October 17, the Prime Minister received an honorary degree at the University, and took the opportunity of speaking on the place which the university, especially the modern university, can fill in the general field of education. He spoke with great cordiality on the function in the educational world of the modern universities, illustrating particularly by the influence which the University of Wales has exercised throughout the entire Principality. He congratulated Sheffield on the progress that it had made, and paid a warm tribute of appreciation to the work of Mr. H. A. L. Fisher, both as Vice-Chancellor of the University and as President of the Board of Education. In particular he spoke of the work done by the applied science department during the whole history of the University, and especially in relation to the supply of munitions for the British Army. "The contribution of Sheffield," the Prime Minister said, "was not merely a contribution drawn from the ranks of its students and its staff on the fighting side. It made a real contribution on the side of the provision of materials—an essential part of the winning of the war." At the same time he pointed out that the work of a modern university was not by any means comprised in the service which it rendered to material needs or to local industries, important as these were; it should be, in addition, the intellectual centre of the whole district in which it was situated. "It leads," he said, "the population which surrounds it to a higher culture; that is the great task of all these young universities; and I am glad to know that Sheffield is thoroughly realising the importance of this aspect of its work, as well as the more and immediately practical part of the enterprise."

THE Salters' Institute of Industrial Chemistry has awarded grants in aid to thirty young persons occupied in chemical factories in or near London to assist them in improving their knowledge of chemistry.

THE estate left by the late Gen. Horace W. Carpentier is valued, says *Science*, at 721,200*l.* The principal beneficiaries are Columbia University and Barnard College, each of which receives 284,000*l.*, and the University of California receives 20,000*l.* From the same source we learn that by the will of the late Mr. Charles W. Lenney, of New York, 10,000*l.* is left to Boston University.

THE Rev. S. Graham Brade-Birks has been appointed lecturer in zoology at the South-Eastern Agricultural College, Wye. Mr. Brade-Birks is an honours graduate of the Victoria University of Manchester, and since his ordination in 1914 has spent much of his leisure researching with his wife (Dr. Brade-Birks) on the English millipedes and centipedes. Last session (1918–19) he acted as demonstrator in the zoological laboratories at the University of Manchester.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, September 22.—M. Léon Guignard in the chair.—The president announced the death of Gustaf Retzius, correspondant for the section of anatomy and zoology.—N. E. **Nörlund**: The polynomials of Bernoulli.—L. B. **Robinson**: A symmetrical system of polynomials.—J. **Chazy**: Solutions of the problem of three bodies where the three bodies form an isosceles triangle.—G. **Sagnac**: The æther and absolute mechanics of waves.—L. **Bruninghaus**: The conditions of production of fluorescence.—J. **Guyot** and L. J. **Simon**: The action of hydrates, oxides, and carbonates of the alkaline earths on dimethyl sulphate. Quicklime and caustic baryta are almost without action upon methyl sulphate; baryta-water and lime-water give barium and calcium methyl sulphates in theoretical quantities. Crystallised barium hydrate or slaked lime with methyl sulphate gives methyl ether and the sulphate of the metal.—M. **Delpech**: Flameless powders. An account of experiments on the effect of adding charcoal, vaseline, and other substances to propellant explosive from the point of view of producing a flameless explosion at the gun. Vaseline and heavy petroleum oil proved to be the most effective, provided

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